Tutorial No. 6: TCP/IP Model Internet Layer: Routing

Exercise 01:

1. Explain the difference between static routing and dynamic routing?
2. Provide the steps involved in static routing
3. What are the main families of dynamic routing?
4. Explain how each family of dynamic routing operates.
5. How is the configuration of dynamic routing protocols done?

Exercise 02

Consider the network represented by the figure below, where machine MA wishes to send a datagram to machine MB. Since the two machines are not on the same subnet, the datagram will need to be routed through both routers R1 and R2.
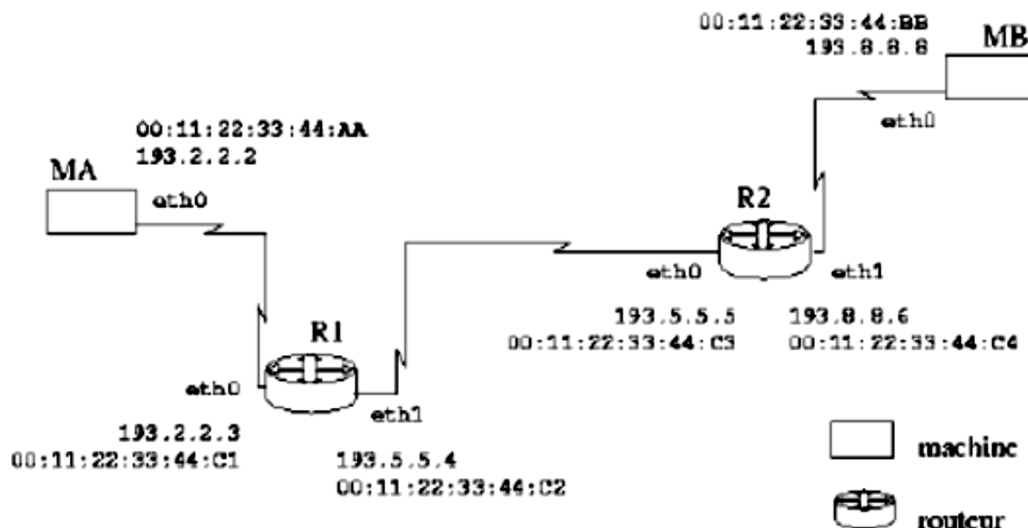
This Internet network is supported by three physical Ethernet networks (3 IP networks) with Internet addresses of class C and a mask of 255.255.255.0, which are 193.2.2.0, 193.5.5.0, and 193.8.8.0.

1. Provide the source and destination addresses of the IP packet prepared to be sent from MA.
2. Provide the simplest initial routing tables (minimal) on each machine (MA, R1, R2, and MB) to allow the packet to be routed from MA to MB.
3. Provide the successive steps necessary for this routing, specifying the addresses used in the Ethernet frame headers sent to carry the above packet.

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Exercise 03

A "show ip route" command applied to a router gives the following result:

```
LAB-B#show ip route
Les codes : C - connecté, S - statique, I - IGRP, R - RIP, M -
mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate
default
U - per-user static route
Gateway of last resort is not set
R 204.204.7.0/24 [120/1] via 199.6.13.2, 00:00:09, Serial0
R 223.8.151.0/24 [120/1] via 199.6.13.2, 00:00:09, Serial0
C 201.100.11.0/24 is directly connected, Serial1
C 219.17.100.0/24 is directly connected, Ethernet0
R 192.5.5.0/24 [120/1] via 201.100.11.1, 00:00:04, Serial1
C 199.6.13.0/24 is directly connected, Serial0
R 210.93.105.0/24 [120/2] via 199.6.13.2, 00:00:09, Serial0
```

1. Provide the topology of the network that you can deduce from this table.

Exercise 04

Consider the following network.
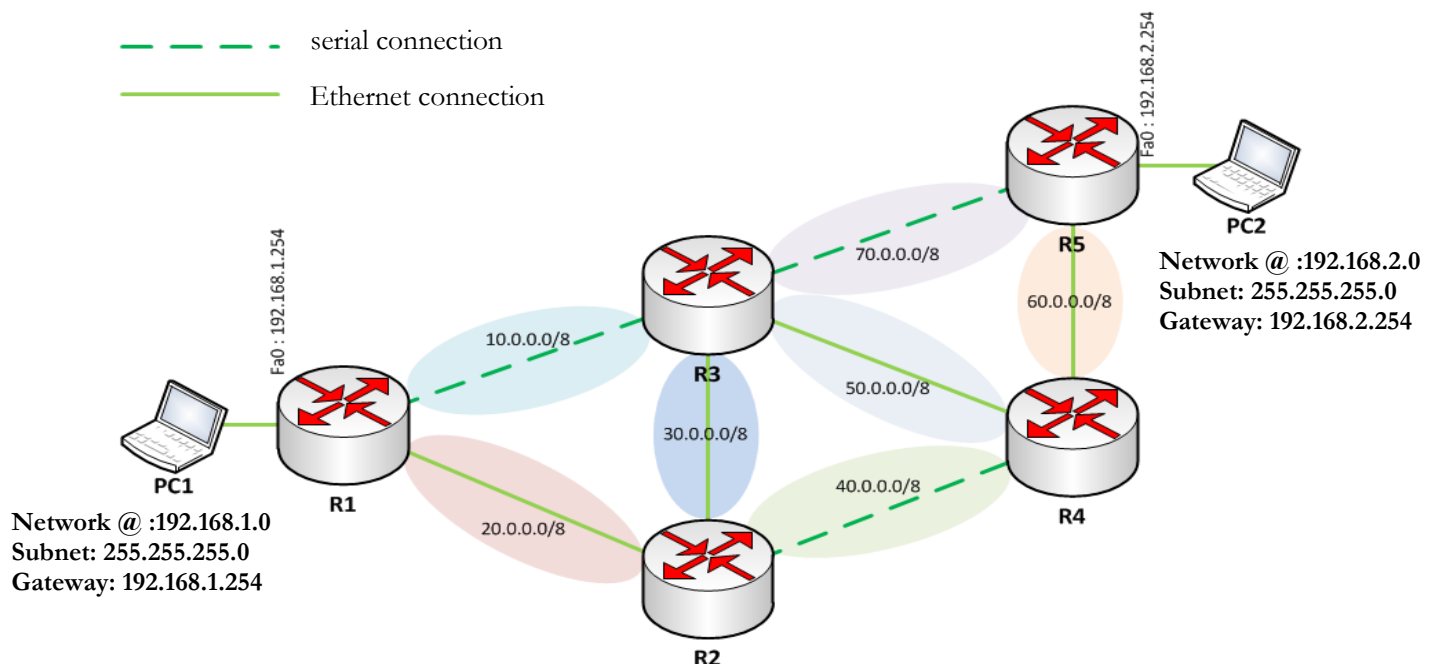
1. Fill in the routing tables of the routers using the following methods:
   a. Distance Vector
   b. Link State